Docket No. 24180-124-005 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re U.S. Patent Application of:

Applicant: RICHARDS *et al.*

Serial No.: 10/046,500

Filed: October 24, 2001

For: POLYPROPYLENE CONTAINER AND PROCESS FOR MAKING THE SAME WITH BARRIER PROTECTION

Examiner: Sandra M. Nolan

Group Art Unit: 1772

Certificate of Mailing

I, hereby certify that this correspondence (along with any documents referred to as attached or enclosed) is being deposited with the US Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on August 11 2004.

Matthew E. Leno, Reg. No. 41,149

SECOND
37 C.F.R. § 1.132
DECLARATION OF DR. ROBERT KNOLL

Commissioner of Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Sir:

I, the undersigned Robert Knoll, Ph.D., declares the following:

1. I am an employee of Pechiney Plastics Packaging, Inc. and was a co-worker of the named inventors on the filing date of the present invention.
2. I have received a Bachelor of Science degree in Nuclear Engineering (1973), a Masters of Science degree in Nuclear Engineering (1974), another Masters of Science degree in Materials Science (1978), and a Ph.D. in Engineering Physics/Nuclear Engineering (1981), all from the University of Wisconsin at Madison on the dates respectively indicated.
3. I have over twenty years of experience as an innovative engineer and applied materials scientist. My experience as a materials scientist includes substantial research and analysis of polymers and polymer processing. For example, in my approximately eight years as a senior

technical staff member at Johnson Controls, Inc., I conducted research and development projects related to injection and biaxial large-strain deformation of polyethylene terephthalate (PET) and other polymers. In the over six years I have currently spent as a senior research associate of materials development with Pechiney Plastic Packaging, Inc., I have conducted research and development projects related to development, analysis and implementation of polymers into production lines to improve product performance and manufacturing efficiency, including blow molding PET and polypropylene (PP).

4. I have reviewed the Office Actions of August 13, 2003, February 9, 2004 and May 13, 2004 in the above-identified patent application, as well as U.S. Patent No. 5,804,016 to Schmidt ("Schmidt") upon which that Office Action relies for its rejection of the pending claims.

5. I paid particular attention to paragraph 7 of the August 13, 2003 Office Action, which is continued in the May 13, 2004 Office Action. I understand paragraph 7 to reject claims 25-28 and 30-41 because they are taught by Schmidt. I disagree. Specifically, paragraph 7 states as follow:

> Schmidt teaches multilayer containers made from polypropylene (col. 10, line 38) and having oxygen scavenging internal layers (col.12, lines 51-53). The outer, or "finish" layer, may be polyethylene terephthalate (col. 8, line 32). The containers are made by stretch blow molding (col. 7, lines 17-36). The performs from which the containers are made have support flanges (col. 9, line 25) and sidewalls that are 13 to 14.5 times thicker than the container made from them (col. 5, line 38). The preform has a flange on the bottom of the neck portion a thickened base and its bottom end is thinner than the upper base-forming portion of the preform (col. 5, lines 3-18). The average panel axial stretch is 3.0 to 3.2 (col. 5, lines 43-46). The preform may have an internal oxygen scavenging layer (col. 12, lines 51-53).

6. I consider myself one skilled in the art of injection stretch blowmolding of PET and PP.

7. I disagree that Schmidt teaches any particular polypropylene container to a person of ordinary skill in the art, as asserted in paragraph 7 of the August 13, 2003 Office Action.

8. I understand Schmidt to be directed to producing multilayer plastic containers having enhanced strength for high temperature and pressure applications. Schmidt indicates that his container comprises inner and outer layers of PET having with high intrinsic viscosity (IV), to withstand high temperature applications, and comprises the remainder of his container with a thick core layer of less expensive post-consumer PET ("PC-PET"). (Col. 3, lines 9-12) Schmidt also indicates that PC-PET typically has an IV lower than that of the high IV inner and outer layers and that layer separation occurs when the layers have an IV difference over a certain magnitude. (Col. 3, lines 13-22). As one of ordinary skill in the art, I understand that Schmidt considered layer separation to be an important commercial issue for carbonated soft drink containers (Col. 3, lines 23-25). I understand Schmidt to focus on how to construct a high temperature and high pressure multilayer container that will not suffer from layer separation.

Schmidt teaches a preform injection method to overcome the layer separation problems caused by having layers having significantly different IV. At column 3, lines 30-36, Schmidt explains:

> It has been found that the injection molding and/or blow molding process conditions can substantially diminish or completely eliminate the problem of layer separation for IV deltas on the order of 0.10 or more. More specifically, the rate of injection and amount of pressure applied in the preform mold are increased to insure higher levels of layer bonding.

Schmidt continues at column 3, lines 54-59, by explaining the technical reason that his preform injection method overcomes the problems caused by the differences in IV:

> It is hypothesized that increasing the IV delta between the virgin PET and PC-PET alters the melt solubility of the materials sufficiently to reduce molecular migration and chain entanglement at the layer boundary, thus decreasing layer adhesion. The enhanced injection rate and pressure overcomes this problem.

The Detailed Description Of The Invention confirms that Schmidt's focus is on using this injection method to overcome the layer separation problems caused by comprising layers of materials with different IVs.

9. Schmidt's claims reinforce my understanding that his invention is focused on this injection method as a means of preventing layer separation. Every one of Schmidt's claims is directed to his injection method.

10. For these reasons, one of ordinary skill in the art would understand Schmidt to teach an injection method for preventing delamination in multilayer containers having layers with different IVs in order to facilitate cheap high temperature, high pressure containers.

11. I have reviewed Schmidt's disclosure of possible alternative materials at column 10, lines 35-54, which states as follows:

> For example, one or more layers of the preform and container, or portions thereof, can be made of various other polymers, such as polyolefins (e.g., polypropylene and polyethylene), polyvinyl chloride, polyarcylate, etc. Suitable polyesters include homopolymers, copolymers or blends of polyethylene terephthalate (PET), polybutylene terephthalate (PBT), polypropylene terephthalate (PPT), polyethylene napthalate (PEN), and a cyclohexane dimethanol/PET copolymer, known as PETG (available from Eastman Chemical Company, Kingsport, Tenn.). Polyesters based on terephthalic or isophthalic acid are commercially available and convenient. The hydroxy compounds are typically ethylene glycol and 1,4-di-(hydroxy methyl)-cyclohexane. In general, the phthalate polyester may include polymer linkages, side chains, and end groups not related to the formal precursors of a simple phthalate polyester previously specified. Conveniently, at least 90 mole percent will be terephthalic acid and at least 90 mole percent an aliphatic glycol or glycols, especially ethylene glycol.

12. As one of ordinary skill in the art, I understand this list of substitute materials to indicate that Schmidt's injection method may employ the listed materials, as substitutes for PET and PC-PET. It follows naturally that the listed substitutes are indicated for use with the injection method that is the focus of the invention. Schmidt does not, however, teach any of the

necessary modifications to the timing, temperature or pressure of his injection process. In fact, Schmidt teaches nothing about how to incorporate any of the listed alternative materials into his invention.

13. To be sure, Schmidt provides no directive or suggestion that his list of alternative materials are to be employed in the described preform that was designed for PET. One of ordinary skill in the art would not consider Schmidt to teach using PP, or any of the other materials it lists as possible alternatives, in a preform of an identical configuration to Schmidt's PET preform.

14. Rather, because Schmidt teaches an injection method, I understand Schmidt to teach that Schmidt's injection method may be used with any of the listed alternative materials. The injection method is the focus of the invention; the specific configuration of Schmidt's PET preform is not. I understand Schmidt's specific PET preform configuration to be a mere example of a working PET preform and incidental to his actual invention that is a preform injection method.

15. In fact, when Schmidt is read as a whole, it becomes apparent that Schmidt's invention is specific to PET. I understand that Schmidt's injection method identifies melt temperatures and material properties (e.g. IV) that are specific to PET. I understand that the "standard pressure" identified in Fig. 6 and described in column 6 is specific to PET, as is the "enhanced pressure" of Schmidt's invention. Likewise, I understand the preform configuration described by Schmidt to be specific to PET.

16. Having read both Schmidt and the Office Action, I understand the Office Action to rely on the features and characteristics of Schmidt's PET preform.

17. Intrinsic Viscosity ("IV") is a common measurement of PET and is typically identified by a vendor. A manufacturer uses the IV measurement to assist it in designing the processing

parameters for injection molding and blow molding. Neither I, nor others of ordinary skill in the art speak or think of PP in terms of IV. Moreover, to my knowledge the container industry does not employ IV measurements of PP in its design of PP containers or the processes by which they are constructed. Instead, PP is measured by its Melt Index, dictated by ASTM 1238.

18. Because the necessity of Schmidt's injection method is premised on IV differential, I and others of ordinary skill in the art would not know how or when to apply the teachings of Schmidt to a container constructed from PP. I do not consider Schmidt's invention applicable to PP.

19. Given that persons of ordinary skill in the art speak of PP in terms of its Melt Index rather than it IV, one of ordinary skill in the art would not consider Schmidt applicable to PP, or know how to manufacture the high temperature, high pressure container of Schmidt from PP, despite the catch-all inclusion of PP in the laundry list of possible alternative materials.

20. Schmidt does not teach myself, or others of ordinary skill in the art, how to construct a high temperature and high pressure preform or container from PP or any of the other listed alternative materials. Schmidt provides no information about the dimensions, contours or stretch ratios necessary for any of the alternative materials. Neither does it provide an indication of the modifications necessary to use PP and achieve the objectives of the invention. Nowhere does Schmidt state that PP can be simply exchanged for PET without any other modifications to the details it provides for the preform and container.

21. If I, or others of ordinary skill in the art, were inclined to construct a PP container comporting with the teachings of Schmidt, I would not produce a PP preform having the detailed configuration of Schmidt's PET preform. Because of the different material properties of PET and PP, I would consider it necessary to modify the size, shape, thickness or other characteristic of the preform or container to accommodate the different material properties of PET and PP.

22. For example PP has a tensile strength of between about 2990 and 5260 psi whereas PET has a tensile strength of about 6680 psi. PP has a modulus of elasticity of between about 156 and 185 Kpsi whereas PET has a modulus of elasticity of about 484 Kpsi. Those of ordinary skill in the art understand these properties to be very important considerations when designing a preform for injection and later blow molding into a container. A PET's IV measurement is also important as well as the corresponding Melt Index of a PP. I am not aware of a direct conversion between the IV of a PET and the Melt Index of a PP.

23. Thus, I and others of ordinary skill in the art would understand that the configuration of Schmidt's PET preform would require modification commensurate with the changes in material. Those of ordinary skill in the art would modify the configuration of the PET preform of Schmidt, if that person was inclined to change the material from PET to PP, in order to achieve the objective container of Schmidt.

24. All statements made herein of my own knowledge are true and all statements made on information and belief are believed to be true; and further these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both under Section 1001 of Title 18 of the United States Code, and such willful false statements may jeopardize the validity of any patent confirmed hereon.

Date: August 10, 2004

Robert W. Knoll, Ph.D.

Robert Knoll, Ph.D.

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